

**U.S. PATENT APPLICATION**  
**for**  
**MOVABLE DISPLAY SUPPORT SYSTEM**

001.1028798

# MOVABLE DISPLAY SUPPORT SYSTEM

## FIELD OF THE INVENTION

[0001] The present invention relates to a movable display support system. The present invention also relates to a support system for a display device or the like which is movable within a work space to support one or more workers in a wide variety of use conditions.

## CROSS-REFERENCE TO RELATED APPLICATIONS

[0002] The following patents and/or patent applications are hereby incorporated by reference: U.S. Patent Application No. TBD titled "Movable Office Support System" filed June 22, 2001 (Attorney Docket No. 76507-386); U.S. Patent Application No. 09/183,023 titled "Workstation" filed October 30, 1998.

## BACKGROUND

[0003] It is known to provide for a display device such as a display panel, video monitor (e.g. CRT), television screen or other video display to present information (in some form) for entertainment or use by one or more workers in an office or other work environment. Display devices are generally associated with electronic equipment or appliances, such as computing devices or video receivers (e.g. television or the like).

[0004] In a typical application, the display device is positioned on a fixed worksurface (such as a table or desk), and thereby is in a relatively fixed or "static" position relative to workers or other persons who enter a work space (such as an office). Where the display device is a conventional video monitor, it may be difficult (if not also inconvenient) to adapt the position of the display device to the needs of one or more workers who may have the need or desire to view or share information presented. Likewise, it can be difficult to move the display device to a less prominent position within the work space, for example when information is to be viewed in private, or when the display device is not in use. In any event, according to known arrangements, it is typically difficult as well as inconvenient to move a display device from an in-use position where information can be viewed and shared readily to a private or stowed position where information is not displayed or not to be shared by persons in the work space. As a result, in many applications, display

devices, once installed in a work space, are not repositioned frequently – even if repositioning would be desirable or advisable under the circumstances.

**[0005]** The more prevalent use of display panels (e.g. flat panel displays) as display devices for computing devices has to some extent lessened the inconvenience of repositioning, but the basic difficulties remain. Moreover, the need to provide a connection for utilities (e.g. power and/or data) to the display device is also a consideration. In typical applications, such connections are made by cables and require suitable proximity to outlets, and cause additional difficulty to be addressed when the display device is to be repositioned within the work space.

**[0006]** Fixture arrangements for display devices, such as adjustable arms, bases or stands, are known. However, such arrangements are typically positioned in a fixed location within the work space and thereby allow for a limited range of motion or change in orientation of the display device. Moreover, it is typical for such arrangements to accommodate only a single display device. When two (or more) display devices are used, the difficulties of positioning and repositioning may be multiplied.

**[0007]** Accordingly, it would be advantageous to provide a support system for a display device that allows for convenient repositioning of the display device within a work space. It would also be advantageous to provide a support system for a display device that provides for a wide range of motion and allows for a variety of orientations of the display device. It would further be advantageous to provide for a support system for a display device that can accommodate one or two or more display devices. It would further be advantageous to provide for a support system that provides for convenient management and interconnection of cables providing utilities to the display device (or display devices). It would further be advantageous to provide for a support system for a display device that can readily be integrated with the articles of furniture within a work space. It would further be advantageous to provide for a support system for a display device that can provide an interface for known fixture arrangements used for display devices.

**[0008]** It would be desirable to provide a system and method having any one or more of these or other advantageous features.

## SUMMARY OF THE INVENTION

[0009] The present invention relates to a movable support system for at least one display device. The system includes a track system and a base movably mounted at a first section to the track system. The system also includes a display support assembly adapted for coupling of the display device and pivotally mounted at a second section of the base. The display device installed on the display support assembly may be selectively positioned for use in a variety of locations relative to the track system.

[0010] The present invention also relates to an apparatus providing a movable support for a display device. The system includes a track system providing at least one track and a support movably coupled at a first section to the track system. The system also includes a display support movably coupled to a second section of the support and configured for coupling of at least two display panels. Each of the display panels may be positioned for use in a variety of locations relative to the track.

[0011] The present invention further relates to a movable support system for at least one display device configured to be coupled to utilities such as power or data through cables. The system includes a track and a support movably mounted at a first section to the track. The system also includes a display support adapted for coupling of a display device and pivotally mounted at a second section of the support. The display device installed on the display support may be selectively positioned for use in a variety of locations relative to the track, wherein the support is configured to provide at least one passage for management of cables configured to be coupled to the display device.

The present invention also relates to a movable support system for use by at least one person in a work space having an entrance. The system includes a track system and a base movably mounted at a first section to the track system. The system also includes a display support assembly adapted for coupling of at least one display device and pivotally mounted at a second section of the base. A display device installed on the display support assembly may be selectively positioned for use in a variety of locations relative to the track system so that each person within the work space may selectively choose a body orientation or a body position relative to the entrance or otherwise within the workspace while using the display device.

## FIGURES

[0012] FIGURE 1 is a perspective view of work space providing a display support system according to an exemplary embodiment.

[0013] FIGURE 2 is a front perspective view of the display support system according to an exemplary embodiment

[0014] FIGURES 3A and 3B are top perspective views of the support system.

[0015] FIGURES 4A and 4B are top perspective views of the display support system within in a work station providing an article of furniture according to an exemplary embodiment.

[0016] FIGURE 5 is a top perspective view of the support system.

[0017] FIGURE 6 is a bottom perspective view of the support system display.

## DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0018] Referring to FIGURE 1, a work space 10 is shown including a workstation 12 configurable for use by one or a plurality of workers or other persons. Workstation 12 includes a movable display support system 14 along with other articles of furniture shown as an associated mobile worksurface or table 16, a fixed worksurface 18, storage units shown as shelving units 20 and lateral files 22. Work space 10 also provides walls shown as partial height partition walls including a base wall 24 and side walls 26 as well as a utility threshold 28 movable on a track 30 (not visible in FIGURE 1). According to any preferred embodiment, the utility threshold is of a type disclosed in U.S. Patent Application No. 09/183,023, titled "Workstation"

and filed on October 30, 1998, and in U.S. Patent Application No. 09/183,021, titled "Work Environment" and also filed on October 30, 1998 (both incorporated by reference herein), providing functionality and features such as power, voice and data connections, display devices or information display panels, lighting, privacy screens, etc. Also shown in work space 10 are chairs 32 (which can be of any conventional type, preferably mobile chairs). As shown, movable display support system 14 includes two display devices shown as display panels 34.

[0019] Referring to FIGURE 2, movable display support system 14 is shown. Support system 14 includes a base 36 mounted to a track system 38 for translating movement (e.g. linear or curved or other) along a path of travel. Track system 38 is installed upon a mounting structure shown as a panel 40 (shown in FIGURE 3). A passage in panel 40 shown as groove 41 can be used for routing various cables to base 36. Support system 14 also includes a display support assembly 42 movably coupled to the base 36. Support assembly 42 includes flanges 44 configured for attachment of a fixture or structure shown as an articuable arm 46 used to support an information display device shown as a display panel 34 (or any other structure such as a base or fixture of any conventional type providing one or more points or "joints" for movement of a mounted display device). According to an exemplary embodiment, support assembly 42 is pivotably coupled to base 36 and each articuable arm 46 is movably coupled to flange 44 to allow suitably positioning and/or orientation of display panel 34 in any of a variety of directions (e.g., up, down, laterally, pivotably) at each point or joint allowing articulation (e.g. translation, extension, retraction, rotation, etc.). As shown in FIGURES 3A and 3B, the selective movement of base 36 with respect to the mounting structure shown as panel 40 (e.g. along track system 38) and/or of support assembly 42 with respect to base 36 provides for the positioning and orientation of one or more of display panels 34 within a substantial range of motion in work space 10; selective movement of display panel 34 with respect to support assembly 42 provides for additional range of motion within work space 10.

[0020] According to an exemplary embodiment shown in FIGURES 4A and 4B, panel 40 for track system 38 is installed horizontally between two storage units 48; a worksurface 50 may be installed within work space 10 over track system 38. According to any preferred embodiment, the system may be integrated with or within articles of furniture in the work space.



**[0021]** Referring to FIGURES 5 and 6, movable display support system 14 is shown in a reverse view so that the underside of base 36 is visible. Base 36 includes a set of passages 52 and an aperture 54 for routing of cables 56 (for utilities such as power, communication and/or data, which may be routed to base 36 through passage or groove 41 of panel 40) to each of display panels 34. Base 36 also includes a hub 58 providing paths or slots 60 for maintaining or retaining cables 56 below the coupling of display support assembly 42. As shown in FIGURE 5, track system 38 includes a set of tracks or rails 62 providing for guided and bounded motion of base 36. As shown in FIGURE 6, a set of roller guides 64 on base 36 engage rails 62 of track system 38. According to a particularly preferred embodiment, hub 58 is rotatable within base 36 and display support assembly 42 is mounted to hub 58 to allow for rotation of display panels 34. Display support assembly 42 may provide a worksurface 66 as well as a handle 68 (both shown in FIGURE 2) to facilitate movement of the display devices.

**[0022]** According to any preferred embodiment, the system will provide for a wide range of motion for one or more display devices, including one or more of the following arrangements or combinations of arrangements for positioning and repositioning: (a) translating movement of the base along the track system, e.g. from one part of the work space to another for open use or stowing (see FIGURES 3A and 3B); (b) rotation of the display support assembly within a range of motion, e.g. to allow open viewing or privacy or stowing of the display device (see FIGURES 2 and 3A and 3B); (c) articulation of the structure or arm, e.g. further to optimize the viewing angle/position (such as to remove glare or enhance visibility) of the display screen or further to enhance sharing/revealing or privacy/concealment of information. According to any preferred embodiment, the wide range of motion provided by the system will enhance the ability of workers or other persons to work collaboratively or to maintain privacy with information or to open or stow the display device (or display devices) conveniently – relatively quickly and easily – and without requiring significant concern for management of cables.

**[0023]** According to alternative embodiments, the movable display support system may be configured for one information display device or two or more information display devices; the information display devices may be of any type, including flat display panels or other types of video monitors (e.g. CRT) or any other type of data or information display device or appliance. The information display

device may be associated with any type of appliance or device, such as a computing device or a television or network, etc.

\* \* \*

**[0024]** In a conventional arrangement for associating a display device within a work space, where the display device is positioned on a fixed worksurface, constraints are typically imposed upon the orientation of a user or users relative to the entrance of the work space or adjacent aisles or opportunities for potential shared zones for viewing the display device with others. For example, if the display device is positioned on a worksurface to the back (or in one side or back corner) of the work space, the user of the work space may be constrained to work with her or his back to the entrance of the work space and information on the display device may be visible to those who enter the work space or walk along the adjacent aisle; if the display device is positioned on a worksurface near the center or front of the work space, the user of the work space may be constrained to "work around" the display device and may be less able to share information on the display device with those who enter the work space.

**[0025]** According to any preferred embodiment, the support system will provide enhanced functionality in comparison with such conventional arrangements, and allow the display device (or display devices) to be positioned selectively to enhance privacy or openness, or generally to facilitate the work to be performed in the work space; the support system is intended to allow the repositioning (including physical placement and orientation) of the display device to suit the needs of the worker. That is, according to any preferred embodiment of the support system, the user or users (without having to adapt or adjust their own posture and/or position) will be able to adapt the positioning and orientation of the display device or devices for various use conditions.

\* \* \*

**[0026]** According to other exemplary embodiments, the display devices may be associated with other articles of furniture and/or physical structures (such as panels, partitions, or walls). It is important to note that the term "article of furniture" is intended to be a broad term and not a term of limitation. The term "article of furniture," as used in this disclosure, may include, without limitation:



systems furniture (e.g., partition wall systems, architectural walls, space frames, work stations, etc.), casegoods (e.g., file cabinets, storage bins, containers, closets, etc.), seating products (e.g., chairs, stools, lounges, etc.), work surfaces (e.g., tables, desk systems, credenzas, etc.), lighting systems, and other accessories.

5

\* \* \*

[0027] It is important to note that the term "information" is intended to be a broad term and not a term of limitation. The term "information" may include information of any type or form or combination. It is also important to note that the terms "workspace" and "work space" are intended to be given broad scope and are not terms of limitation. It is also important to note that the construction and arrangement of the elements of the system as shown in the preferred and other exemplary embodiments is illustrative only.

10

\* \* \*

[0028] Although only a few embodiments of the present inventions have been described in detail in this disclosure, those skilled in the art who review this disclosure will readily appreciate that many modifications are possible (e.g., variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, use of materials, colors, orientations, protocols, etc.) without materially departing from the novel teachings and advantages of the subject matter recited in the claims. Accordingly, all such modifications are intended to be included within the scope of the present invention as defined in the appended claims. The order or sequence of any process or method steps may be varied or re-sequenced according to alternative embodiments. In the claims, any means-plus-function clause is intended to cover the structures described herein as performing the recited function and not only structural equivalents but also equivalent structures. Other substitutions, modifications, changes and omissions may be made in the design, operating conditions and arrangement of the preferred and other exemplary embodiments without departing from the spirit of the present inventions as expressed in the appended claims.

20

25